DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

In general, the specific structure of the gearing is not shown in the figures. In particular, below are some of the claimed features missing from the drawings:

Regarding claims 11,17,18,

- A "gear step" is not shown and the "material-locking and/or positive-locking connection" between them is not shown. The axes being claimed are not shown in the figures.

Regarding claims 19-23,

- The "planetary gearing" along with all its related structural components is missing and also the orientation or configuration of this gearing is missing.

Regarding claims 24-26,

- The "single-step or multi-step configuration" of the gearing is not shown.

Regarding claim 27,

- The specific gearing, "combined spur planetary gearing", with at least "one gear step" and its respective configuration is not shown.

Regarding claims 28-30,

- The "tensioned gear step is tensioned in a rotationally symmetric manner." is not depicted in the drawings.

These features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 11-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 11,

The term “material-locking” is broader and fully envelops the term “positive-locking connection”. Therefore, it is unclear what the metes and bounds of this claim are. Why is the term positive-locking here if it's fully enveloped by material-locking?

The rest of the claims are also rejected because they are dependent on claim 11.

Regarding claim 16,

There is insufficient antecedent basis provided for "the carrier element" claimed. For purposes of examination examiner takes the position that the carrier element is the same as the common supporting element of claim 11.

Regarding claims 28-30,

It is unclear what the applicant means by "…gear step is tensioned in a rotationally symmetric manner." The phrase is confusing and more explanation is needed to explain how the apparatus given by this limitation works. For purposes of examination, the examiner will take the broadest reasonable interpretation for the phrase since it is not clearly defined in the specification or drawings. An interpretation, as applied below, is that the springs taught by Mochizuki et al. (US patent 5230462) are located symmetrically about the rotational axis of the gear and provide tension to the gear (col.10 lines 45-47).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 11-26,28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art (APA), seen below, in view of Mochizuki et al. (US patent 5240462).

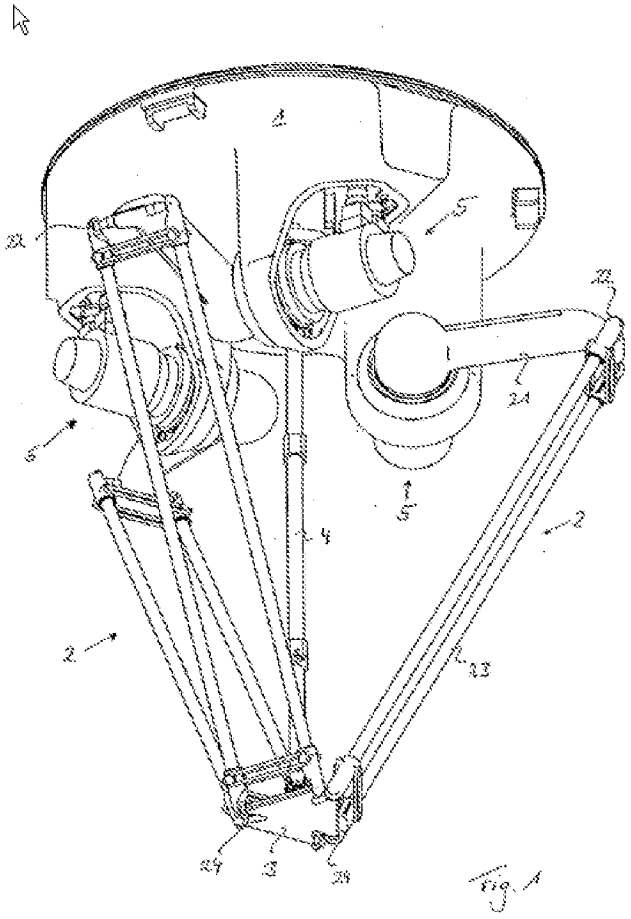

Figure i- The APA provided by applicant.

Regarding claim 11,

The applicant claims a device having:

- a base element corresponding to a base element(fig.1, 1) in the APA.
- At least three motor/gearing units disposed on the base element corresponding to the motor/gearing units (fig.1, 5) of the APA.
- A common supporting element on which at least one gripping means for gripping an object is disposed. The supporting

element corresponds to the supporting element (fig.1, 3) of the APA, and the applicant recites a 112th 6th paragraph limitation in regards to the gripping means which is disclosed on page 2, paragraph 24 in the discussion of the APA.

- At least three arms corresponding to arms (fig.1, 2) of the APA. One end is connected to the motor unit and a second end hinge-connected to the common supporting element which is also taught by the APA, fig.1.
- The motor/gearing unit having a gearing with at least one gear step which is tensioned. The APA fails to disclose this.
- The gear step, having a material-locking or positive-locking connection between gearing components, and being free or virtually free from backlash over the whole motional range of the gearing. The APA fails to disclose this as well.

Regarding claim 12,

Applicant claims the device with precisely three arms, precisely three motor/gearing units and where the units are positioned on one side each of an imaginary triangle. The APA teaches all this structure in figure 1 along with the proper positioning.

Regarding claim 13,

Applicant claims the device where the imaginary triangle is an equilateral. The APA also teaches this as seen in figure 1.

Regarding claim 14-16,

Applicant claims the device comprising a telescopic forth shaft connected to the carrier element. The APA teaches a telescopic forth shaft (fig.1,4) connected to a carrier element (fig.1, 3).

Regarding claims 17-30,

The APA fails to teach to all the specific gearing structure claimed throughout claims 17-30.

It is clear that the APA fails to teach the specific structure of the gearing unit used in the device along with the specific arrangement of axes as claimed by the applicant.

Mochizuki et al. teaches the following planetary reduction gear (seen below) unit which can be used in robots:

FIG. 10

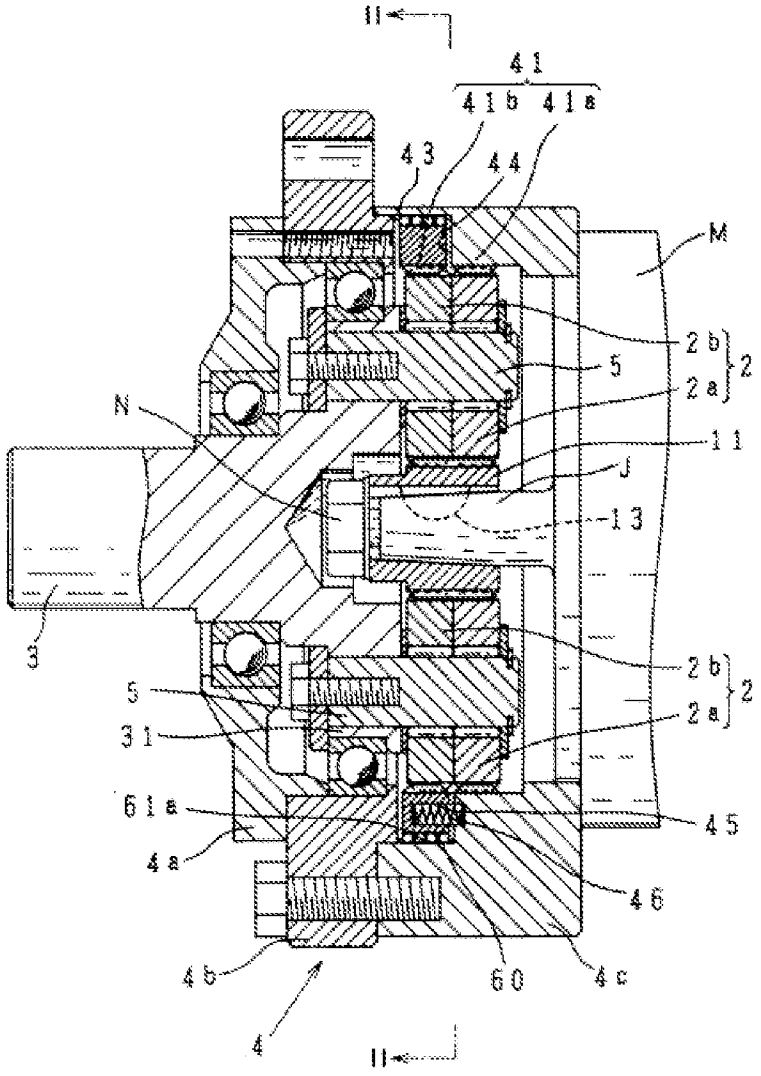

Figure ii- Mochizuki et al.'s figure.

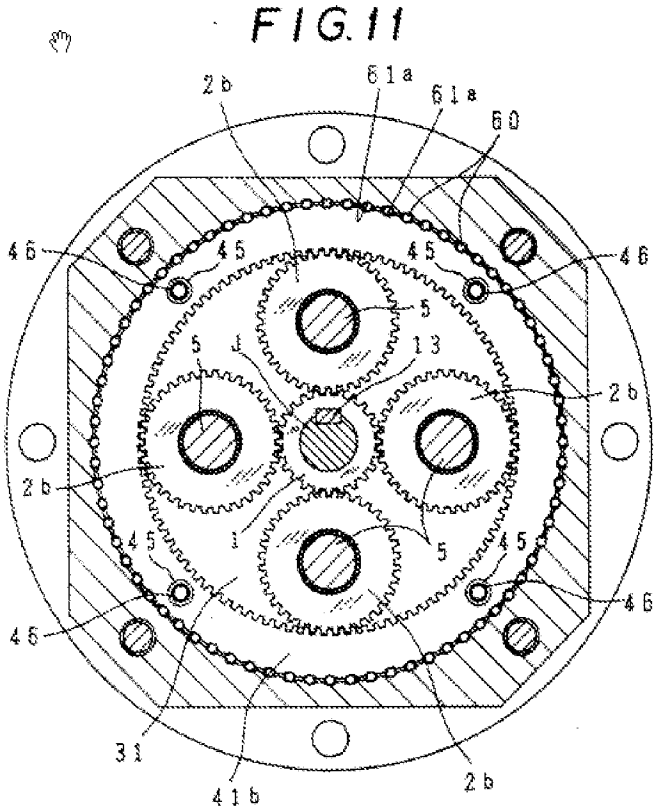

Figure iii- Mochizuki et al.'s figure.

Regarding claim 11,

Mochizuki et al. teaches a gearing unit with a gear step which is tensioned via springs (fig. 11, 46). This controls the positioning of the internal gear (col.8, lines 51-59). The gear step has a material-locking connection as seen in figure 11 since the gears are interlocked together. Additionally, the gearing unit is free of backlash as discussed in the abstract and col.9, lines 1-5.

Regarding claims 17-18,

Applicant claims the device having at least one gear step, preferably all gear steps having coaxially running rotation axes on the drive side and power-take-off side and a motor being connected to this at least one gear step.

Mochizuki et al. teaches a gear step seen in figure 10 and 11 where the rotation axes of the gears on the drive side and power take off side run coaxially and offset to each other, and Mochizuki et al. teaches a motor M (fig.10, M) coaxially connected to the gear step for the purpose of driving the gearing.

Regarding claims 19-20,

Applicant claims the gearing of the device being a planetary gearing which has planet wheels which mesh between a sun wheel and a ring wheel and which are respectively fixed by a planet wheel bolt to a planet carrier and are mounted rotatably about the respective planet wheel bolt. Mochizuki et al. teaches a planetary gearing unit (fig. 10, 4) which has planet wheels (fig.10, 2), which mesh between sun wheel (fig.10, 11) and internal gear or ring wheel (fig.11, 41b) and the planet wheels are mounted rotatably about the respective bolt seen in figure 10.

Regarding claims 21-23,

Applicant claims the gearing of the device being a planetary gearing, where the gearing has planet wheels which mesh between a sun wheel and ring wheel, with the axes of the planet wheels being arranged offset in comparison to the axis of the sun wheel. Mochizuki et al. teaches all these components as discussed in claims 19-20 and also teaches the axes of the planet wheels being offset with the sun wheel as can be seen in figures 10 and 11.

Regarding claims 24-26,

Applicant claims the gearing of the device as being of single-step or multiple-step configuration. Mochizuki et al. teaches a planetary gearing unit having a multiple-step configuration as can be seen in figure 11. There are multiple step reductions possible using this gear set up.

Regarding claims 28-30,

Applicant claims the device wherein the at least one tensioned gear step is tensioned in a rotationally symmetric manner. Mochizuki et al. teaches this via figure 10 and 11 and col.10 lines 45-47, where as seen the springs are located symmetrically about the gearing unit and therefore tension the gear step in a rotationally symmetric manner.

The device or robot claimed by the applicant only differs from the APA in that the specific gearing claimed isn't disclosed by the APA. The specific gearing unit, planetary gearing unit, has been used as reduction gears in devices such as robots (col.1, lines 32-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the planetary gearing unit disclosed by Mochizuki et al. in the device or robot disclosed in the APA for the purpose of providing necessary gear reductions with backlash suppression, decreased error in rotation angle and decreased noise generation (col.1, lines 5-12).

7. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art (APA), seen below, in view of Mochizuki et al. (US patent 5240462) and Altenbokum et al. (US patent 4106366).

Applicant claims the device with gearing which is a combined spur-planetary gearing with at least one gear step being present, the drive-side axis of which runs axially offset relative to its axis on the power take off side.

The APA and Mochizuki et al. as discussed above teach the device combined with a planetary gearing unit but fail to disclose a combined spur-planetary gearing.

Altenbokum et al. discloses a planetary gearing that has a spur gear combined inside (fig.1, 3) and (col.2, line 16 and line 31). This planetary gear also has a gear step seen in figure 1 wherein the drive side axis running through element 1, is offset to the power take off side axis running through element 5. This planetary gear unit provides a play-free or backlash free planetary drive.

As discussed above, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Altenbokum et al. with the teachings of the APA and Mochizuki et al. in order to provide a planetary gearing free of backlash and with a spur gear. The examiner notes that the choice of types of gears used in planetary gearing can vary and spur gearing is a simple and obvious choice. It would also be obvious to try different types of gears in order to improve backlash reduction.

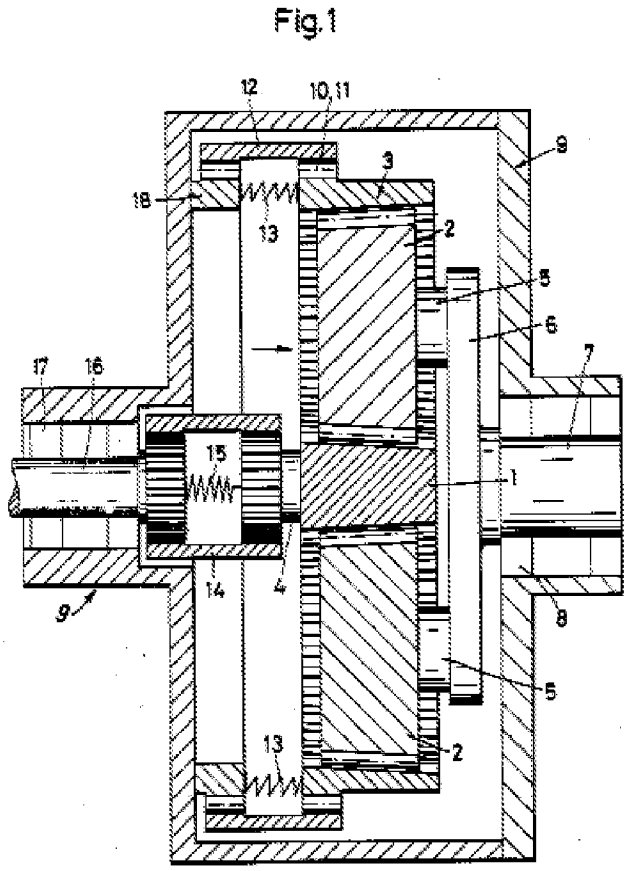

Figure iv- Altenbokum et al. figure.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Prior art includes more gearing units similar to applicants disclosed invention and other prior art devices similar to applicants disclosed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Diaz whose telephone number is (571)270-

5461. The examiner can normally be reached on Monday-Thursday 7:30am-6:00pm, Friday's off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571)272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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